COLORIMETRIC / SPECTROPHOTOMETRIC PROCEDURES

Colorimetric/Spectrophotometric recording requirements in the **Sample Analysis Records** should include:

a) wavelength (if adjustable)
b) cell path length (if interchangeable)
c) lot number of commercially prepared reagent in use
d) calibration curve referenced (or slope, y-intercept, and correlation coefficient)
e) date, time and analyst (sample analysis)
f) some methods require logging date and time sample collected due to short holding time (ex. chlorine)
g) instrument identification (if more than one is available)
h) type of parameter/analyte
i) some methods may require temperature
j) program area (drinking water, wastewater, or SHW) - when lab performs parameter analysis for more than one Act
k) sample identification
l) sample results (with units of measurement: ex.: mg/L, etc). Some methods may require calculations to attain sample results. If so, the laboratory will need to record sample volume, absorbance, and any other factor used in the calculation.
m) comment section

Volume, concentration of spike, spike reading, and percent recovery must also be recorded in the **Sample Analysis Records** (when applicable). In most methods (excluding chlorine) spikes and duplicates must be performed at a frequency of 10%.

Daily calibrations of the instrument must include, at minimum, a blank and two standards.

The **calibration curve** must be established per lot of reagent(s) for each instrument used (ex.: if free and total residual determinations are made, a curve must be prepared for each, due to different lots of DPD reagents in use), either annually or when a new lot of reagents are used. Some methods may require more frequent curves. This curve must be comprised of at least three (3) standards and a blank that cover the range of the method although five to seven standards are recommended (refer to each method, this requirement may vary). A laboratory that is using linear regression to define a curve must use at least five (5) standards. These values of true concentrations versus observed readings, or absorbance versus true concentration must be documented with the curve.

The **calibration curve** should include:

a) date generated
b) analyst's initials
c) instrument identification
d) lot number of reagent/standard
e) cell path length
f) wavelength
g) true values of standards and blank versus observed values of standards and blank (or absorbance versus concentration)
h) graph of true values (x-axis) and observed values (y- axis). Some methods/parameters may need to use absorbance versus concentration and may allow for the "physical" (plotted) curve to be substituted for the following logged information: y-intercept, slope, and correlation coefficient
i) parameter method number and reference (SM, EPA, etc.)

This curve should be a linear regression line (or "best fit" line) and analysts should not "connect-the-dots".

For those samples requiring pretreatment (digestion, distillation), a blank and at least one standard should also be pretreated. Sample dilutions must be made prior to color development (an additional sample portion will be needed for this purpose).